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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,745	03/10/2004	Susumu Matsui	04146 /LH	6424
1933	7590	06/09/2005	EXAMINER	
FRISHAUF, HOLTZ, GOODMAN & CHICK, PC 220 5TH AVE FL 16 NEW YORK, NY 10001-7708			KHATRI, PRANAV V	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 06/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/798,745

Applicant(s)

MATSUI ET AL.

Examiner

Pranav V. Khatri

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 10-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, and 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 02/10/2004 Jun 7, 04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

It is noted that claim 14 is mistakenly grouped with invention 2, but it is depending upon claim 8 which is included in the elected invention. Therefore, claim 14 will be examined on the merit.

Election/Restrictions

Claims 10-13 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on May 23, 2005.

Applicant's election without traverse of group 1 in the reply filed on May 23, 2005 is acknowledged.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Isobe et al. (US Patent No. 5,373,391).

Regarding claim 1, Isobe et al. teaches a polygon mirror (Fig. 1), comprising: a mirror body (3) shaped in a regular polygon and having circumferential surfaces (along the outer diameter of 3), a top surface (top of Fig 1), and a bottom surface (bottom of Fig 1), a reflection surface formed on each of the circumferential surface (Fig 1 Numeral 4, and Col 4 Line 64 - Col 5 Line 7); a machining reference surface (top surface of 3

Art Unit: 2872

where 2 sits on) provided on one of the top and bottom surfaces, machined to form a mirror surface (Col 1, Lines 63-66, "planeness") and used as a reference surface for machining the reflection surface on each of the circumferential surfaces; and an assembling reference surface (bottom surface of 2 at the top surface) provided on one of the top and bottom surfaces shaped in parallel to the machining reference surface (top surface of 3 and the bottom surface of 2 are parallel) machined to form a rough surface (Col 1, Lines 63-66, "roughness").

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isobe et al. in view of Nakamura et al. (US Patent No. 5,692,287).

Regarding claim 2 and 3, Isobe et al. discloses the claimed invention as set forth above except for wherein surface roughness Ra of said planished machining reference surface is determined by the formula with the range of $0.16\mu\text{m} \leq \text{Ra} \leq 21.8\mu\text{m}$, or

$0.2\mu\text{m} \leq \text{Ra} \leq 20\mu\text{m}$.

However, Nakamura et al. teaches the mean roughness to be 6.3um, which is a number in the range of the formula (see Nakamura et al. Col 5 Lines 8-10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the teachings of Isobe et al. polygon mirror, deflecting apparatus with a surface roughness of Nakamura et al. because the combination would allow for a better rigidity and clamping force of the work, the durability of the tool, the rigidity of the machine (See Nakamura et al. Col 5 Lines 1-5).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isobe et al. in view of Nakamura et al., and in further view of Suzuki (US Patent No. 6,449,000).

Regarding claim 4, Isobe et al. in view of Nakamura et al. discloses the claimed invention as set forth above except for wherein at least a groove is provided in circular form along either inside of outside edge of said roughed assembling reference surface.

However, Suzuki teaches wherein at least a groove is provided in circular form along either inside of outside edge of said roughed assembling reference surface (see Suzuki Fig 10 Numeral 32a and Col 5 Line 4-6), the office interprets the grooves to be circular, and the grooves would follow a circle of the rotational mirror.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the teachings of Isobe et al. in view of Nakamura et al. with the grooves from Suzuki because it would be easier to float up the rotational mirror, and the groove would provide for setting balance weights to be set in the grooves, the aforementioned dynamic unbalance can be greatly relieved without

causing unbalance in the direction of center axis of shaft (see Suzuki Col 5 Lines 32-36).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isobe et al.

Regarding claim 5, Isobe et al. discloses a deflecting apparatus comprising; a base member (see Fig 3 Numeral 7) a polygon mirror (Figure 3 Numeral 3) having reflection surfaces formed in regular polygon on each circumferential surface thereof (Fig 1 Numeral 4); and a flange member (Fig 3 Numeral 11) holding said polygon mirror, being rotatably mounted against said base member;

However, the polygon mirror of Fig 3 lacks to disclose the wherein said polygon mirror has a planished machining reference surface, and a roughed assembling reference surface, parallel with said planished machining reference surface; wherein said roughed assembling reference surface is butted and bonded onto said flange member, but does disclose it in the background wherein said polygon mirror has a planished machining reference surface (Col 1, Lines 63-66, "planeness"), and a roughed assembling reference surface (Col 1, Lines 63-66, "roughness"), parallel with said planished machining reference surface; wherein said roughed assembling reference surface is butted and bonded onto said flange member (Fig 3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the teachings shown in Fig 1 to Fig 3 having wherein said polygon mirror as a planished machining reference surface, and a roughed assembling reference surface, parallel with said planished machining reference surface

in order to provide or ensure a simplified configuration, and the surfaces in contact with the mirror surface formation member do not require highly accurate finish as in the prior art, which contributes to keeping the manufacturing costs for these parts down, as taught by Isobe et al. (see Isobe et al. Col 4 Lines 1-6).

Claims 6, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isobe et al. in view of Nakamura et al.

Regarding claims 6 and 7, Isobe et al. discloses the claimed invention as set forth above except for wherein surface roughness Ra of said planished machining reference surface is determined by the formula with the range of $0.16\mu\text{m} \leq \text{Ra} \leq 21.8\mu\text{m}$, or $0.2\mu\text{m} \leq \text{Ra} \leq 20\mu\text{m}$.

However, Nakamura et al. teaches the mean roughness to be $6.3\mu\text{m}$, which is a number in the range of the formula (see Nakamura et al. Col 5 Lines 8-10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the teachings of Isobe et al. polygon mirror, deflecting apparatus with a surface roughness of Nakamura et al. because the combination would allow for a better rigidity and clamping force of the work, the durability of the tool, the rigidity of the machine (See Nakamura et al. Col 5 Lines 1-5).

Regarding claim 9, as a combination of Isobe et al. in view of Nakamura et al. discloses an image forming apparatus equipped with an optical deflecting apparatus (see Nakamura et al Col 1 Lines 6-9).

Claims 8 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isobe et al. in view of Nakamura et al., and further in view of Suzuki.

Regarding claim 8, Isobe et al. in view of Nakamura et al. discloses the claimed invention as set forth above except for wherein at least a groove is provided in circular form along either inside of outside edge of said roughed assembling reference surface.

However, Suzuki teaches wherein at least a groove is provided in circular form along either inside of outside edge of said roughed assembling reference surface (see Suzuki Fig 10 Numeral 32a and Col 5 Line 4-6), the office interprets the grooves to be circular, and the grooves would follow a circle of the rotational mirror.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the teachings of Isobe et al. in view of Nakamura et al. with the grooves from Suzuki because it would be easier to float up the rotational mirror, and the groove would provide for setting balance weights to be set in the grooves, the aforementioned dynamic unbalance can be greatly relieved without causing unbalance in the direction of center axis of shaft (see Suzuki Col 5 Lines 32-36).

Regarding claim 14, as a combination of Isobe et al. in view of Nakamura et al., and in further view of Suzuki discloses an image forming apparatus equipped with an optical deflecting apparatus (see Nakamura et al Col 1 Lines 6-9).

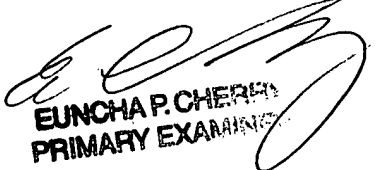
Art Unit: 2872

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pranav V. Khatri whose telephone number is 571-272-8311. The examiner can normally be reached on M-F, 8:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Pranav Khatri
Examiner
Art Unit 2872


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PRIMARY EXAMINER